



STATE OF MICHIGAN
TERRI LYNN LAND, SECRETARY OF STATE
DEPARTMENT OF STATE
LANSING

CONTENTS OF THIS PACKET

This packet contains the following information regarding mechanic testing, certification, and trainee permit:

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- [Selected Secretary of State Branch Offices](#)
- [Mechanic Certification Most Often Asked Questions](#)
- [Suggested Study/Reference Material](#)
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Read the information in this packet carefully. Then, if you have further questions about the materials, contact the Automotive Licensing Division, Mechanic Certification Section, Lansing, Michigan 48918, or telephone (517) 373-9060.

INFORMATION FOR THE MECHANIC TRAINEE

There are two ways a person can get the skills needed to be a mechanic. The first is by going to a school, which offers automotive training. This usually includes hands-on learning along with classroom studies. The other way is by working at a repair shop with an experienced mechanic who can teach proper repair methods and see that the work done by the trainee is correct.

Most good mechanics have learned their trade by both schooling and experience on the job. Today's cars and trucks are becoming more and more complicated to repair. This means that both training and experience are more important than ever to the person who wants to earn a living as a mechanic.

If you are currently performing major repairs on motor vehicles in Michigan, you must be a certified mechanic or hold a valid trainee permit.

A mechanic trainee permit is valid for a period of two years from the date of issue in the major repair categories listed on the permit. A permit may not be renewed. Upon expiration of the trainee permit, a mechanic trainee must either become certified or stop performing repairs in the categories listed on the permit.

A mechanic trainee may perform repairs only in the categories listed on the permit under the supervision of a mechanic who is currently certified by the State of Michigan in those repair categories.

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A mechanic trainee should display his or her trainee permit in a conspicuous location, and when a mechanic trainee works on a motor vehicle, his or her name and trainee permit number must appear on the customer's final invoice. The name and certification number of the supervising mechanic must also appear on the final invoice. It is the responsibility of trainees and certified mechanics to insure that their names and numbers are not used inappropriately by their employers.

The Bureau of Legal and Regulatory Services may take action to suspend or revoke a mechanic trainee permit if a trainee misrepresents the need for repairs, performs unnecessary repairs, or makes false or misleading statements in connection with a diagnosis or repair. In addition, a mechanic trainee may be required to obtain additional training or discontinue performing certain repairs if it is determined that the mechanic or trainee disregarded or departed from accepted industry repair standards.



MICHIGAN DEPARTMENT OF STATE

Terri Lynn Land, Secretary of State

Lansing, Michigan 48918-1200

MECHANIC TESTING OFFERED AT SELECTED SECRETARY OF STATE BRANCH OFFICES

The Bureau of Legal and Regulatory Services offers written tests at selected Secretary of State branch offices around the state. On the back of this notice is a list of these test locations. Please save the list for future reference.

To schedule yourself for testing at one of the Secretary of State branch offices, select the office nearest you and call for an appointment to take the test(s) you need.

PLEASE NOTE:

- Tests are given by appointment only. . . NO WALK-INS, PLEASE.
- Tests are written, multiple choice format.
- The branch offices can help with scheduling and taking written tests only. If you have questions about mechanic test results or any other mechanic certification issues, or need special testing (oral or interpreter), please contact:

Michigan Department of State
Bureau of Legal and Regulatory Services
Automotive Licensing Division
Licensing Section
Lansing, MI 48918-1210
Telephone: (517) 373-9460

- If you reach a disconnected telephone number, contact another Secretary of State branch office for updated information on testing, or contact the Licensing Section at the address or telephone number above.
- Reminder: All motor vehicle mechanics performing major repairs for compensation must be certified by the Michigan Department of State in the categories in which they perform repairs. A person who is not certified must obtain a trainee permit by contacting the Licensing Section.

IMMEDIATE NEED TESTING

If you have an offer of employment that you will lose if you do not become certified quickly, contact the Licensing Section to find out if you qualify for immediate need testing.

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SECRETARY OF STATE MECHANIC TEST LOCATIONS

<u>Branch Office (City)</u>	<u>Telephone Number</u>	<u>Branch Office (City)</u>	<u>Telephone Number</u>
Adrian	(517) 265-8981	L'Anse	(906) 524-6915
Allegan	(616) 363-8778	Lansing Downtown	(517) 334-8305
Alpena.....	(989) 356-9742	Lansing Delta Township	(517) 334-8305
Ann Arbor.....	(734) 665-0627	Lapeer.....	(810) 664-4064
Bad Axe	(989) 269-7186	Livonia 7 Mile.....	(248) 476-4538
Battle Creek	(269) 962-4045	Ludington	(231) 843-4353
Bay City	(989) 667-0558	Manistee	(231) 723-6471
Benton Harbor	(269) 925-1328	Manistique	(906) 341-2231
Bessemer.....	(906) 667-0271	Marine City	(810) 765-9100
Beulah.....	(231) 882-4831	Marquette.....	(906) 226-7556
Big Rapids	(231) 796-8510	Menominee	(906) 863-4423
Cadillac	(231) 775-3231	Mt. Morris.....	(810) 732-6040
Cheboygan	(231) 627-3159	Mt. Pleasant.....	(989) 772-0132
Clinton Township	(586) 791-1250	Muskegon	(231) 773-8900
Coldwater.....	(517) 278-2467	Newberry	(906) 293-3340
Detroit Vernor	(313) 541-5454	Owosso.....	(517) 334-8305
Dowagiac	(269) 782-6512	Petoskey	(231) 347-9681
East Tawas	(989) 362-6135	Port Huron	(810) 984-4164
Escanaba.....	(906) 786-5830	Portage	(269) 337-3800
Flint South.....	(810) 732-6040	Saginaw South	(989) 777-4780
Gaylord	(989) 732-1413	St. Ignace.....	(906) 643-9230
Grand Rapids Southeast	(616) 363-8778	Sandusky	(810) 648-4553
Hart.....	(231) 873-5423	Sault Ste. Marie	(906) 632-6780
Hastings.....	(269) 945-3144	Shelby Lakeside	(586) 532-1407
Highland Park	(313) 541-5454	Southfield.....	(248) 476-4538
Hillsdale	(517) 437-2476	Stanton	(989) 831-4106
Holland.....	(616) 363-8778	Taylor.....	(313) 292-5810
Houghton	(906) 482-7270	Three Rivers	(269) 273-5855
Howell	(517) 546-9826	Traverse City	(231) 922-5220
Iron Mountain.....	(906) 774-5202	Warren Dequindre	(586) 575-9583
Iron River	(906) 265-4811	Waterford	(248) 674-0485
Jackson Downtown.....	(517) 788-9535	West Branch	(989) 345-1199
Kalamazoo Downtown.....	(269) 337-3811	Wyoming.....	(616) 363-8778
Kalkaska	(231) 258-9166	Ypsilanti	(734) 528-0923

MECHANIC CERTIFICATION

MOST OFTEN ASKED QUESTIONS

MECHANIC CERTIFICATION REQUIREMENTS

1. **Q.** Who must be certified?
 - A.** All persons who repair motor vehicles for compensation, including the reconditioning, replacement, diagnosis, adjustment or alteration of the operating condition of the vehicle or any component or sub-assembly, in any category of major repair, must be certified by the State of Michigan. Any person performing major repairs who is not certified must obtain a mechanic trainee permit in the categories of repair in which he or she works.

2. **Q.** What are the motor vehicle repair categories which require state certification?
 - A.** The Automobile and Light Truck repair categories for vehicles under 10,000 pounds G.V.W. are:

1. Engine Repair	7. Electrical Systems
2. Engine Tune-up/Performance	8. Heating & Air Conditioning
3. Front End, Suspension & Steering Systems	9. Collision-Related Mechanical Repair
4. Brakes & Braking Systems	10. Unitized Body Structural Repair
5. Automatic Transmission	11. Pre-1973 Vehicles
6. Manual Transmission, Front & Rear Drive Axles	

The Heavy-Duty Truck repair categories for vehicles over 10,000 pounds G.V.W. are:

1. Engine Repair - Gasoline	5. Suspension & Steering Systems
2. Engine Repair - Diesel	6. Electrical Systems
3. Drive Train	7. Collision-Related Mechanical Repair
4. Brakes & Braking Systems	

Repair categories for other on-road vehicles are:

1. Motorcycle	2. Recreational Trailer
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3. **Q.** How do I become a certified mechanic?
 - A.** You first must pass a test for each repair category in which you want certification. You are not eligible to apply for certification until you have passed the appropriate repair category test. The application for certification is included with your test result letter. You must complete the application and return it with the appropriate fee to the Bureau of Legal and Regulatory Services.

4. **Q.** What is the difference between a master mechanic and a specialty mechanic?
 - A.** A mechanic certified in all of the first 8 categories of automobile and light truck repair is a **master automobile mechanic**. Similarly, a mechanic certified in all of the first 6 categories of heavy-duty truck repair is a **master heavy-duty truck mechanic**. A mechanic certified in less than the first 8 automobile and light truck or the first 6 heavy-duty truck repair categories is a **specialty mechanic**.

5. **Q.** When and where can I take the tests?
 - A.** The State of Michigan motor vehicle mechanic tests are available at selected Secretary of State branch offices throughout the state. To find out the offices which administer the tests, telephone your local Secretary of State branch office or the Bureau of Legal and Regulatory Services at (517) 373-9460. There is a \$6.00 fee for each test.

6. **Q.** I have worked as a motor vehicle mechanic for many years. Do I have to take tests?
 - A.** Yes, you must pass a test for each repair category in which you want to be certified. The law does not provide a "grandfather clause." The only way to qualify for state certification is to pass the tests. However, if you have passed tests administered by the National Institute for Automotive Service Excellence (ASE), you may be eligible to apply for state certification. Telephone the Bureau of Legal and Regulatory Services at (517) 373-9460 for further information.

7. **Q.** I took the state test but lost, or did not receive, my test results. How do I find out if I passed?
 - A.** If you have not received your test results after six weeks, or have lost them, you can get assistance by contacting the Bureau of Legal and Regulatory Services at (517) 373-9460. **SECRETARY OF STATE BRANCH OFFICE PERSONNEL CANNOT HELP YOU.** They do not have specific information concerning your test results.

8. **Q.** I took the state tests and did not pass. Can I take the tests again and will I have to pay the test fees again?
- A.** Yes, you may retake tests you did not pass. You must pay the \$6.00 test fee for each test you retake. You are, however, encouraged to do additional studying or get more training before taking them again.
9. **Q.** Can a person who has a disability or difficulty with the English language take the mechanic tests?
- A.** Yes, persons who would have difficulty taking a written test because of special needs should telephone the Bureau of Legal and Regulatory Services at (517) 373-9460. Persons who use TTY equipment may telephone (517) 485-5530.

CERTIFICATION FEES

10. **Q.** What does it cost to become certified?
- A.** To become certified you must complete an application for certification (which is sent with your test result letter) and return the application with the \$25.00 fee to the Bureau of Legal and Regulatory Services. You may make application for certification in any number of repair categories at one time and pay a single application fee of \$25.00. If you pass additional tests after you become certified and your certification is current, an amended certificate with the new categories added will automatically be mailed to you at no additional cost.
11. **Q.** Must I renew my certification?
- A.** Yes, there is an annual (yearly) renewal fee of \$20.00. You are responsible for notifying the Bureau of any address change. A renewal form will be mailed to you approximately 45 days prior to your certification expiration date. Certification renewals received after the expiration date require payment of a \$10.00 late fee. If your certificate has been expired over one year, telephone (517) 373-9460 for the proper form.

MECHANIC TRAINEE PERMITS

12. **Q.** What is a mechanic trainee permit?
- A.** The mechanic trainee permit makes it possible for the non-certified mechanic to work at a repair facility. A mechanic trainee employed by a repair facility must work under the direct supervision of a certified specialty or master mechanic.
13. **Q.** What are the repair categories for a mechanic trainee?
- A.** The mechanic trainee categories are the same as those for certification. A person may obtain a trainee permit in any number of categories of repair, but cannot remain a mechanic trainee in any single repair category for more than two years.
14. **Q.** How do I apply for a mechanic trainee permit?
- A.** You must complete an Application for Motor Vehicle Mechanic Trainee Permit. For an application, contact the Bureau of Legal and Regulatory Services at (517) 373-9460. The completed application must be returned with the \$20.00 application fee. **No fee is required if you are a state-certified mechanic with an unexpired certificate.**

If you have additional questions about the Michigan mechanic certification program or requirements, contact:

Michigan Department of State
Bureau of Legal and Regulatory Services
Licensing Section
Lansing, MI 48918-1210
Telephone: (517) 373-9460
Fax: (517) 335-2810

SUGGESTED STUDY/REFERENCE MATERIAL FOR AUTOMOBILE & LIGHT TRUCK REPAIR

ASPIRE, INC. - <http://www.aspireinc.com>

Aspire offers self-study and leader-led training programs to meet the needs of every level of technician. Here are some of the programs available:

- P** **FAST PASE:** Using live action video and state-of-the-art, computer-generated animation, FAST PASE shows you exactly why one response is correct, and why the rest aren't. Get experience answering ASE-style questions for each automotive certification area. There is also a program designed to help you avoid possible pitfalls in typical test situations. Ten programs in all.

Advanced System Theory (AST): Learn the principals of operation that make cars work. The Advanced Systems Theory program includes videotapes and workbooks covering Compression/Thermodynamics, Electricity/Electronics, Ignition Systems, Air/Fuel/Carburetion, and Computer Systems.

Master Technician Series: Learn the specific systems and operation for OEM vehicles. Videotapes and workbooks cover GM, Ford, Chrysler, Bosch, Nissan, Toyota, and Honda engine control systems.

F.I.R.S.T. (Fundamental Inspection Repair System Training) and E.D.G.E. (Emission Diagnostician Graduate Education): Prepare for the enhanced emissions program coming to your area, and hone your skills as an emissions and driveability diagnostician. Video and color slide support augments the technician workbooks and instructor's guides to provide a complete learning experience.

Aspire also offers additional training and distance learning programs designed to meet your individual needs. For more information write: ASPIRE, Inc., 925 Lincoln Highway, Morrisville, Pennsylvania 19067 or telephone: (800) 435-1050.

CHEK-CHART PUBLICATIONS - <http://www.chekchart.com>

- P** **Chek-Chart's ASE Certification Program:** Chek-Chart offers ASE test preparation materials for on-the-job or classroom study. Includes sample questions and answers. Updated for 1998, there are eight books, one for each ASE automobile test. You can purchase individual books or choose the slipcased eight-book set. Note: The Engine Performance Specialist Test (L1) is NOT included in the eight-book set. You must order this separately. Chek-Chart also offers Classroom and Shop Manuals which provides the student with the basic theories and laws on specific subjects providing numerous, step-by-step service procedures with extensive photographs.

To place an order within the United States, telephone their toll-free number at: (800) 662-6277 and ask for Operator "W." Outside the United States, telephone (414)-884-0908. For more information covering their many products, write: Chek-Chart Publications, 320 Soquel Way, Sunnyvale, California 94086 or telephone: (408) 739-2435.

CDX AUTOMOTIVE TRAINING SERIES - <http://www.cd-x.com>

The CDX Automotive Training Series offers an education package containing 32 CD-ROM discs covering the complete automotive technical curriculum - just about everything you need to know about motor vehicles and how they work. Whether you are servicing, repairing, or selling them, the series is designed for:

- & Basic training of automotive technicians - the complete curriculum
- & Refresher training of experienced technicians - getting to grips with newer technologies such as fuel injection and ABS braking.
- & Technical understanding for salespeople - concepts and principles of how cars work.

For United States inquires, contact CDX Automotive Training at: DVP Media PO Box 251 Fortville, Indiana 46040 or telephone: (888) 873-2239.

DANA CORPORATION

DANA offers Automotive/Light Truck and HD Truck training. For catalog and course information, write: Dana Customer Industrial School, 8000 Yankee Road, Ottawa Lake, Michigan 49267 or telephone: Carole Deakin, Training Coordinator, at: (419) 535-4253.

DELMAR PUBLISHERS - <http://www.delmar.com/>

P Automotive Technician Certification (ATC) Challenge: The ATC Challenge is an exciting interactive multimedia product (CD-ROM) designed to aid automotive students and technicians in preparing for 10 main ASE tests at their own pace. The user can set-up their session for learning mode or take an actual simulated exam - all questions are truly ASE-style and vary in difficulty. Furthermore, the user selects the difficulty level, session type and which exams they want to prepare for. Additionally, the user can tag questions with the bookmark feature or use the notes feature to write reminders or detailed notes on a specific topic area.

P ASE Test Prep: This book prepares Automotive Technology students for ASE tests in all eight areas of automotive certification. All of the ASE tasks and explanations are listed in the book followed by an ASE-style question based on the task.

Each chapter begins with a pretest to provide the student with an indication of the amount of study required to pass the ASE test. As in the ASE tests, some questions are accompanied by illustrations. The text includes a glossary to assist the student in defining difficult terms.

Today's Technician Series: The Today's Technician Series details the latest technology in Automotive Brake Systems, Computer Systems, Electricity & Electronics, Engine Repair and Rebuilding, Heating and Air Conditioning, Suspension and Steering Systems, Basic Automotive Service and Systems, Manual Transmissions and Transaxles, Medium/Heavy Truck Brake systems.

For additional information write: Delmar Publishers 7625 Empire Drive, Florence, Kentucky, 41042 or telephone: (800) 347-7707 (*continued*).

NOTE: Delmar Publishers' also offers an extensive list of “everything” automotive resources (too much to list) from industry leading books, and interactive software as well as extensive web resources.

FEDERAL-MOGUL - <http://www.federalmogul.com>

Federal-Mogul offers engine reconditioning (gas, diesel), chassis (four wheel alignment, steering and suspension) and high performance machining Technical Training classes at its Worldwide Technical Training Center in Ann Arbor, Michigan. Classes run from two to four day sessions. If you require on-site training or additional information write: Federal-Mogul Worldwide Technical Training Center, 3935 Research Park Drive, Ann Arbor, Michigan 48108 or telephone: (313) 761-3688

FORD MOTOR COMPANY

P Ford Technicians' Preparedness Program: A training program designed to help automobile technicians prepare for the ASE tests. Package consists of nine booklets; Booklet #1 Test Taking Techniques, plus individual booklets containing sample test questions for each of the eight ASE automobile tests. Each sample test is followed with an Answer Selection and Analysis section that provides technical support for the correct answers. An instructor guide book with 35mm slides is also available.

Service Training Aids Catalog: This catalog lists and describes automotive service training aids available from Ford Motor Company.

Training Materials:

- & Video Tapes
- & Instructor Guides (with slides)
- & Textbooks
- & Wall Posters

For the free Service Training Aids Catalog, write: Ford Technical Service Publications, Ford Motor Co., P.O. Box 07150, Detroit, Michigan 48207 or telephone: (800) 782-4356.

GENERAL MOTORS CORPORATION

Authentic General Motors Training Materials: Videos, Technician's Guides, Instructor's Guides, Student Workbooks, Overhead Slide Sets, Diagnosis Books, Service Manual and Service Bulletins Computer Based Training (CBT) and more. These are the same materials used in GM training centers for GM dealer training

For a free catalog of Training Materials, write General Motors Training Materials Headquarters at 1972 Brown Road Auburn Hills, Michigan 48326-1701 or telephone: (800) 393-4831.

HELM PUBLICATIONS - <http://www.helminc.com>

Supplier of Ford Factory Service training materials including videotapes, instructor guides and interactive CD-ROM. Ford's Tools of the Trade catalog lists and describes automotive service training materials, training via FORDSTAR and Technical Publications available from Ford Motor Company. The training materials have been developed for basic, entry-level training as well as for the advanced and experienced student.

Although many of the materials are Ford-oriented, many of them could be described as "general automotive." HELM Publications also carries service and repair manual publications for many Domestic and Import manufacturers.

For inquiries and catalog information, write: HELM Publications Division, 14310 Hamilton Avenue, Highland Park, Michigan 48204 or telephone: (800) 782-4356.

MITCHELL INTERNATIONAL, INC. - <http://www.mitchellrepair.com>

Mitchell Manuals publishes automotive service, repair and estimating information for mechanical and collision professionals.

- P** The Mitchell ASE Test Preparation Series: One book for each of the eight ASE Automobile tests. Each book covers how to prepare for the test, a review of service and repair operations, a complete sample test, an answers and analysis section, and a glimpse of the future (a look at automotive technologies that may appear on future tests). Free brochure available.

Mitchell Training and Diagnosis and Testing Manuals: Three training manuals cover: Air Conditioning, Antilock Brakes, and Engine Performance. Three diagnosis and testing manuals cover: Electronic Ignition, Domestic Electronic Fuel Injection Systems, and Import/Domestic Electronic Fuel Injection Systems. For more info, write: Mitchell International, 9889 Willow Creek Road, San Diego, California 92196-0260 or telephone: (800) 648-8010 (in 619 area code, call 578-6550).

MOTOR AGE - <http://www.motorage.com>

- P** Motor Age Training for ASE Certification: Self-Study Training Units for 24 of ASE's automobile, med/hvy truck, and collision/refinishing tests. Each unit contains technical self-study preparation and sample test questions. System Specific Technical Training Series also available. Request complete ordering information, prices, etc. from: Motor Age Training for Certification, 201 King of Prussia Rd., Radnor, Pennsylvania 19089 or telephone: (610) 964-4240.

NAPA AUTO PARTS - <http://www.napaonline.com>

NAPA offers technician training clinics and schools (over 250 available). Please contact your nearest NAPA Auto Parts Store for a free Technical Training catalog or call 800-LET-NAPA for the location of the nearest store. For information, write to: NAPA Training Dept., 2999 Circle 75 Parkway, Atlanta, Georgia 30339 or telephone: (770) 956-2200 (*continued*).

P For NAPA's 1998 NAPA Institute of Automotive Technology (N.I.A.T.) Self-study Training programs, videos and/or assessment test catalog information, write: N.I.A.T. Program Headquarters W. Shiawassee Ave., Suite 105, Fenton Michigan 48430 or telephone: (800) 292-NIAT (6428). N.I.A.T. offers a complete self-study technical training program covering over 20 course topics. The N.I.A.T assessment test, developed by NAPA and ASE is designed to identify mechanics strengths and training needs. Made up of 280 questions, covering nine automotive categories.

PRENTICE HALL CANADA - <http://www.prenhall.com/ect/>

P Guide to the Automobile Certification Examination, Fifth Edition: Written by James G. Hughes. This book contains approximately 1600 questions and answers that are similar to the questions found on ASE and State of Michigan Automobile & Light Truck exams. To obtain a copy of this publication, contact a major book outlet in your area and request: Guide to the Automobile Certification Examination, Fifth Edition, ISBN 0-13-011853-2. To order by telephone, contact Prentice Hall Canada: (800) 643-5506.

PROFESSIONAL AUTOMOTIVE CAREER TRAINING (PACT)

<http://www.pact-autotech.com>

PACT offers technical training classes designed to enhance a technician's skills in the diagnosis and repair of today's cars. Classes emphasizing instructor/technician interaction for groups of 12 to 15 are provided nationwide.

Three-to-five-day, in-depth classes on: Brake Systems, Suspension and Steering, Electrical Systems; Heating and Air Conditioning, Electricity and Electronics, Engine Performance (Generic), GM Driveability, Ford Driveability, Chrysler Driveability, Import Driveability and IM240 Diagnostics. These classes include a comprehensive student workbook with hands-on reinforcement exercises and worksheets.

PACT also delivers evening and on-day information seminars in group settings.

For more information write: PACT, 14555 Lorain Avenue, Cleveland, Ohio 44111 or telephone: (216) 941-2318.

NOTE

P ASE tests and State of Michigan tests are similar in content.

***If you would like more information on specific areas contact the
Bureau of Legal and Regulatory Services at (517) 373-9060.***

SUGGESTED STUDY/REFERENCE MATERIAL FOR HEAVY-DUTY TRUCK REPAIR

EATON

Training Courses: Eaton offers product service training on its steering axles, drive axles, and Fuller transmissions. In Michigan only, in-shop training and/or diagnostic visits may be arranged by contacting Ryan Matthews at: (972) 242-8615 ext. 520. For additional information telephone Eaton's main Michigan Headquarters at: (616) 342-3000.

FEDERAL-MOGUL- <http://www.federalmogul.com>

Federal-Mogul offers engine reconditioning (gas, diesel), chassis (four wheel alignment, steering and suspension) and high performance machining Technical Training classes at its Worldwide Technical Training Center in Ann Arbor, Michigan. Classes run from two to four day sessions. If you require on-site training or additional information write: Federal-Mogul Worldwide Technical Training Center, 3935 Research Park Drive, Ann Arbor, Michigan 48108 or telephone: (313) 761-3688.

FREIGHTLINER CORPORATION

Training Courses: Freightliner offers courses for technicians sponsored or employed by authorized Freightliner dealers. Courses cover vehicle service and maintenance, air conditioning, electrical troubleshooting, electronic engine systems, cab repair and rebuilding, and medium truck engine rebuilding. Courses are taught at training centers in Atlanta, GA; Bridgeport, NJ; Chicago, IL; Cleveland, NC; and Portland, OR.

Training Materials: Self-Paced and Video Training programs are available to Freightliner dealer and customer technicians through authorized Freightliner dealers.

For information about courses and materials contact: Freightliner Corporation, Service Training Dept. (CII-SDF), P.O. Box 3849, Portland, Oregon 97208, or telephone: (503) 735-8510.

GMC TRUCK

Catalogs:

- & Expanding Technical Excellence. A comprehensive listing of GMC training courses offered through GM Training Centers. Medium-duty truck courses are available to GM dealer personnel and to secondary and post-secondary instructors.
- & GMC Truck Service Publications Catalog. Form # X-8950 provides a listing of service manuals, wiring diagrams, overhaul manuals, maintenance schedules, service bulletins, component manufacturers publications, and more.
- & GMC Truck Service Video Catalog. Lists service video presentations on GMC medium trucks (*continued*).

For these catalogs, contact a local GM Training Center or Zone Office, or write: Service Publications Dept., GMC Truck and Coach Operation, Truck and Bus Group, 31 Judson St., Pontiac, Michigan 48058.

Video catalog also available from: Service Film Library, Regan Productions, 19730 Ralston, Detroit, Michigan 48203.

MACK TRUCKS, INC.

Training Classes: Mack offers classes for their technicians at various Mack Truck locations. Classes vary in length from two to five days. Emphasis is on maintenance, repair, and troubleshooting of various Mack Truck components. Courses offered in diesel engines, transmissions, carriers and drive lines, V-MAC, steering and suspension systems, brakes, electrical systems and air conditioning. Training and videos are available on request.

For course availability and scheduling, write: Mack Trucks, Inc., Service Training Department., P.O. Box 1780, Allentown, Pennsylvania 18105 or telephone: Service Training Registrar's Office at: (610) 709-2695.

MOTOR AGE - <http://www.motorage.com>

- P** Motor Age Training for ASE Certification: Self-Study Training Units for 24 of ASE's automobile, med/hvy truck, and collision/refinishing tests. Each unit contains technical self-study preparation and sample test questions. System Specific Technical Training Series also available. Request complete ordering information, prices, etc. from: Motor Age Training for Certification, 201 King of Prussia Rd., Radnor, Pennsylvania 19089 or telephone: (610) 964-4240.

NAVISTAR INTERNATIONAL TRUCKS

Training Classes: Navistar International conducts classes on diagnosis/overhaul of International diesel engines, drive train components, brakes, steering, and H-D air conditioning systems. In-house training locations are conducted at three International truck training locations:

- & Chicago, IL
- & Dallas, TX
- & Pennsauken, NJ

Self-paced study training programs, videos and workbooks are also available. For additional information and scheduling write: Navistar International Transportation Corp., International Training Enrollment Ctr., 455 N. Cityfront Plaza Dr., Chicago, IL 60611 or telephone I-TEC at: (800) 365-0088.

TECHNICAL TRAINING, INC. (TTI) - <http://www.technicaltraininginc.com/>

TTI offers a wide variety of instruction consistent with standards established by the Society of Automotive Engineers (SAE J2017, Guidelines for the Development of Performance-based Technician Training, SAE Paper No. 950756 © Society of Automotive Engineers, Inc.). TTI can provide complete training program development from inception with a Needs Analysis, to customizing your existing service and training materials into a performance-based system.

TTI can provide your company with:

- & Technical Instructors
- & Technical Writers
- & Service / Diagnostic Technicians
- & Technical Hotline Representatives
- & Service, Diagnostic and Operator's Manuals
- & Parts, Tools and Equipment Catalogs

For more information, contact Tim Burke, Account Executive, Technical Training, Inc., 2750 Product Dr, Rochester Hills, Michigan 48309 or telephone: (800) 837-5222.

TMC (The Maintenance Council) - <http://www.trucking.org/cc/councils/tmc/>

For catalog of Publications and Training Programs, (books, manuals, charts, newsletters, videos and more.).

NOTE

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***If you would like more information on specific areas contact the
Bureau of Legal and Regulatory Services at (517) 373-9060.***

SUGGESTED STUDY/REFERENCE MATERIAL FOR UNITIZED BODY STRUCTURAL REPAIR

ASSOCIATION OF AUTOMOTIVE AFTERMARKET DISTRIBUTORS (AAAD)/PARTS PLUS

The AAAD/Parts Plus Tech Plus Training Program offers a comprehensive listing of video training tapes (250+), factory clinics, factory schools, manuals and publications, and hot line numbers for the automotive technician and countermen.

Contact the program manager at local Parts Plus Distribution Center for details, write: Director of Training, AAAD/Parts Plus, 5050 Poplar Ave., Suite 2020, Memphis, TN 38157, or telephone: (901) 682-9090.

CHIEF AUTOMOTIVE SYSTEMS

Training Courses: Chief offers advanced classes on the structural repair of unitized body and body-on-frame vehicles as follows:

- & Structural Repair Technology, 4 day (32 hrs)
- & Structural/Suspension Damage Analysis 4 day (32 hrs)
- & Computerized Measuring System (Genesis), 4 day (32 hrs)
- & Universal Measuring System (UMS), 2 day (32 hrs)

Videos: Chief video training programs show proper use of equipment and how to measure, analyze, and repair structural damage on unitized vehicles.

Publications: Chief's publications include a newsletter (Shoptalk), training bulletins, and manuals for using each product.

Chief Automotive Systems, Inc., PO Box 1368, 1924 East 4th St., Grand Island, NE 68802-1368, or call Marty Hettle at 800-445-9262.

CHRYSLER CORPORATION

Instructional Materials: Unibody Analysis and Repair Fundamentals: Covers damage analysis and repair fundamentals as related to unibody structures.

Manuals: Unibody Dimension, Joints, and Seams, lists body dimensions, sealing locations and weld locations for reliable repairs.

To order catalog listing these and other technical publications, write: Chrysler Corp., Training Program Development, 26001 Lawrence Ave., Center Line, MI 48015, CIMS 423-21-06.

I-CAR - <http://www.I-CAR.COM>

Training Courses: Collision Repair (32 hours) Includes Identification and Analysis of Damage; Measuring Principles and Techniques; Straightening Systems and Techniques; Welding in Collision Repair; Replacement of Structural Parts; Restoring Corrosion Protection; Suspension, Steering and Alignment; and Working with Mechanical and Electrical Parts.

For information contact: I-CAR, 3701 Algonquin Rd., Suite 400, Rolling Meadows, IL 60008, Phone: 800-ICAR-USA (800-422-7872); or FAX: 800-590-1215.

MOTOR AGE - <http://www.motorage.com>

- P** Body Repair/Paint Refinish Series: Motor Age offers four Self-Study Guides covering the collision repair series of ASE certification: B2 on paint & refinishing; B3 & B4 on structural and non-structural repair and B5 covering mechanical and electrical components. The collision repair series provides valuable background information, including the ASE Task List, detailing exactly what type of knowledge and experience is necessary for the individual specialty area.

Easy-to-read text and illustrations provide the important background information you'll need to understand each area of certification and fill in any gaps which may exist in your technical knowledge. Each self-study guide contains sample questions, written in ASE-style along with detailed answers explaining why a particular solution is correct.

Request complete ordering information, prices, etc. from: Motor Age Training for Certification, 201 King of Prussia Rd., Radnor, Pennsylvania 19089 or telephone: (610) 964-4240.

SOCIETY OF COLLISION REPAIR SPECIALISTS (SCRS) - <http://www.scrs.com>

SCRS and its 38 state affiliates provides a variety of collision repair training in large and small cities with classes being held for as few as 25. Attendees are given a certificate of completion.

Seminars

- & Damage Report Training
- & Selling Collision Repairs
- & Body Shop Managers Tune-Up
- & Employees are Managers Too
- & Managing for Success
- & Total Vehicle Alignment in the Modern Unibody
- & Audatex: The Misunderstood Estimating System
- & Negotiation: A Skill You Can Learn
- & Hazardous Materials Handling

Videotapes: SCRS has available, a series of video training tapes in VHS, Beta I, or Beta II, from 10 to 39 minutes in length. A composite tape is also available.

Manuals: Total Vehicle Alignment in the Modern Unibody (*continued*).

Other training programs are available upon request. For a training brochure, prices, and more information, contact: SCRS Corporate, P.O. Box 3765, 17401 Irvine Blvd., Suite N, Tustin, CA 92680 or call (714) 838-3115 or FAX: (714) 838-3049.

VITAL SYSTEMS AUTOBODY TRAINING LIBRARY

VITAL Systems' Autobody Training Videos define the latest repair techniques. They also teach personnel the responsibilities of the autobody repair process, while at the same time demonstrating task and time management. Each segment uses the approach of: "Planning," "Preparation," and "Performance."

Adherence to the steps depicted in each video will ensure a high quality repair, as well as proper procedures to get the job done right the first time, avoiding costly waste.

#101 Quarter Panel Replacement

Technicians are shown the importance of doing little things, like checking the parts before beginning repairs, and how they save hours throughout the process by planning ahead. Corrosion protection, flanging and test-fitting are just a few steps detailed in the performance stage. (approximately 22 minutes)

#309 Introduction to Unibody Repair

This program serves as an excellent refresher course for the journeymen and an overview to the entire unibody analysis and correction process. Time saving steps are emphasized with the responsibility of quality repairs placed squarely on the shoulders of the technicians. (approximately 26 minutes)

#310 Unibody: Measuring Systems

Dedicated and universal measuring systems are completely defined and shown how to be properly set up. Unibody measuring concepts are graphically illustrated and a thorough inspection prior to any set-up is taught. It is clearly emphasized to inspect the vehicle completely after set-up for hidden damage to eliminate costly delays awaiting re-inspection. (approximately 33 minutes)

#311 Unibody: Damage Analysis

We all know unibodies absorb energy. This tape thoroughly explains why and where that trapped energy can be found. Technicians are introduced to our exclusive Leverage Wheel, that when properly applied can save countless hours of guesswork. Proper analysis will reveal hidden damage and eliminate those time-consuming tie ups on the bench. (approximately 33 minutes).

#312 Unibody: Damage Correction

Last-in First-out, stress relieve and apply the concept of the Leverage Wheel. Systematic approach to unibody correction can increase efficiency and quality. We clearly demonstrate It's not only possible to repair unibody vehicles to within less than ½ mm, but it saves hours in the long run. (approximately 36 minutes)

All titles available in Spanish. Each video \$59.00/Complete Set of 12: \$595.00.

For info on prices and local availability contact VITAL Systems, Inc., P.O. Box 133, Crestline, Kansas 66728, or call 1-800-848-2574.

NOTE

P ASE tests and State of Michigan tests are similar in content.

***If you would like more information on specific areas contact the
Bureau of Legal and Regulatory Services at (517) 373-9060.***

MECHANIC STUDY GUIDES

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MECHANIC STUDY GUIDE

Engine Repair

Automobile and Light Truck Repair

Listed below are a number of items and subjects which make up the mechanic certification test identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items. **NOTE:** There could be up to 5 additional pre-test questions. These questions will not count but may be used on a later version of the test. Your answers to these pre-test questions will not affect your score. Since you won't know which they are, you should answer all questions.

Engine Block Diagnosis & Repair - 12%

- Using a bore gauge
- Honing a newly bored cylinder
- Engine bore diagnosis
- Installing pistons in block
- Cleaning and assembling

Cylinder Head/Valve Train Diagnosis & Repair - 21%

- Intake valve deposits
- Valve tappet clearance
- Valve timing understanding
- Valve tappet adjustment
- Valve guide wear
- Valve refacing
- Valve spring diagnosis
- Noisy lifter diagnosis
- Valve seats

General Engine Diagnosis - 19%

- Oil consumption
- .001" cylinder leakage test
- Compression test
- Sludge in crankcase
- Vacuum testing
- Low oil pressure
- Crankcase blow-by diagnosis
- Spark plug diagnosis

Piston Diagnosis & Repair - 10%

- Piston design
- Ring groove diagnosis
- Piston ring diagnosis

Crankshaft & Camshaft Diagnosis & Repair - 15%

- Crankshaft end-play
- Journal taper diagnosis
- Installing cam bearings
- Camshaft diagnosis
- Crankshaft diagnosis

Miscellaneous - 23%

- Understanding measurements to Engine
- Assembling procedures
- Diagnosing coolant bubbling
- Micrometer reading
- Bolt head markings
- Engine break-in
- Water pump diagnosis
- Turbocharger diagnosis
- Engine R&R procedures
- Basic carburetor diagnosis
- Vibration/misfire diagnosis
- Plastigage use

SAMPLE QUESTION:

A transverse mounted engine with front wheel drive must be removed from the car. All of the following are generally recommended **EXCEPT:**

- A. Removing the engine and transaxle as a unit.
- B. Disconnecting the speedometer cable.
- C. Disconnecting the half-shafts.
- D. Removing the differential gears.

ANSWER: D

MECHANIC STUDY GUIDE

Automatic Transmission

Automobile & Light Truck Repair

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Component Diagnosis - 8%

Hydraulic pump
Torque converter
Clutch pack clearance
Pump gear clearance

Internal Operation - 32%

Gear train end-play
Clutch band servo
Planetary gear set
Multiple disc clutch packs
Passing gear operation
Lock-up converters
Vacuum modulator
Valve body shift valves
Shift points
Governor operation
TPS (throttle position sensor)
operation

General Diagnosis - 18%

Harsh engagement
Governor malfunctions
Fluid diagnosis
Glazed band diagnosis
Fluid leak diagnosis
Pressure testing
Spool valve diagnosis
Burned clutch diagnosis
Fluid loss diagnosis

Driveability Diagnosis 28%

Downshift problems
Improper shifting
Upshifting problems
Modulator problems
Shift linkage adjustment
No drive diagnosis
Creeps in neutral
Restricted filter
Noisy transmission
Slipping Transmission
Sluggish operation

Repair Procedures - 6%

Transmission remove & replace
Stator support bushing wear
Cooler line repair
Pump to converter engagement

Miscellaneous - 8%

Valve identification
Fluid types
Transaxle knowledge
Valve body components
Direct drive condition

SAMPLE QUESTION:

It takes a moment for the car to move after the gear selector has been placed in "drive." Which of the following would cause this problem?

- A. A defective neutral safety switch.
- B. A partially plugged screen.
- C. An inoperative lock-up converter clutch.
- D. None of the above.

ANSWER: B

MECHANIC STUDY GUIDE
Manual Transmission, Front & Rear Drive Axles
Automobile & Light Truck Repair

Listed below are a number of items and subjects which make up the mechanic certification test identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items. **NOTE:** There could be up to 5 additional pre-test questions. These questions will not count but may be used on a later version of the test. Your answers to these pre-test questions will not affect your score. Since you won't know which they are, you should answer all questions.

Component R & R - 6%10%

Cluster gear remove & replace
Extension housing seal remove & replace
Synchronizer replacement

Transmission/Transaxle Diagnosis - 32%

Fluid diagnosis
Hard shifting complaints
Transmission v.s. transaxle comparison
Cluster gear end-play
Transaxle gear recognition from picture
Synchronizer problems & operation
3, 4 & 5 speed diagnosis from picture
(4 questions)
Overdrive operation
Extension housing bushing wear
Noise diagnosis
Defective output shaft

Final Drive - 30%

Ring gear run-out
Noise diagnosis
Differential diagnosis
Differential pinion nose angle
Ring & pinion gear sets
Ring & pinion backlash
Pinion bearing preload
Final drive ratio
Pinion seal remove & replace
Limited slip diagnosis
Differential bearing preload
Lubricant Types

Axle Shaft/C.V. Repair - 10%

CV boot installation
Drive axle noise diagnosis (2 questions)
CV joint operation
Vibration Diagnosis

Clutch Diagnosis & Repair - 10%

Clutch disc operation
Noise diagnosis
Chatter diagnosis
Shifting problem diagnosis

Miscellaneous - 12%

Bearing removal and installation procedures
Drive train noise diagnosis
Gear recognition
Trans interlock function
Understanding how direct drive & gear reduction is accomplished

SAMPLE QUESTION:

The main reason for making a rear end gear tooth contact pattern is to check:

- A. Carrier end-play.
- B. Carrier bearing preload.
- C. Axle gear clearance.
- D. Pinion depth.

ANSWER: D

MECHANIC STUDY GUIDE
Front End, Suspension & Steering Systems
Automobile & Light Truck Repair

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Alignment Diagnosis - 34%

"Toe" adjustment procedures
Caster adjustment procedures for various suspension systems
Camber understanding
Camber adjusting procedures for various suspension systems
Total alignment procedures
Caster understanding
Strut suspension alignments

Tire Wear Diagnosis - 10%

Tire wearing angles
Inside tread wear only
Cupping
Feathered outside edge wear
Wear on both inside & outside of tire

Suspension Diagnosis - 18%

Ball joint diagnosis
Measuring curb height
Torsion bar remove & replace
Ball joint remove & replace procedure
MacPherson suspensions
Automatic leveling systems

Steering Diagnosis - 18%

Rack & pinion diagnosis
Power assist diagnosis
Tie rod end diagnosis
Steering gear adjustment
Steering linkage diagnosis
Power steering system bleeding

Driveability Diagnosis - 16%

Pulling diagnosis
Road crown compensation
Wandering or darting diagnosis
Shimmy & bounce diagnosis
Steering wheel centering

Miscellaneous - 4%

Brake rotor R & R precautions
Wheel bearing adjustment

SAMPLE QUESTION:

A car has excessive lean on turns (body roll).
This could be caused by:

- A. Bad shocks.
- B. Worn sway bar bushings.
- C. Weak springs.
- D. All of the above.

ANSWER: D

MECHANIC STUDY GUIDE

Brakes & Braking Systems

Automobile & Light Truck Repair

Listed below are a number of items and subjects which make up the mechanic certification test identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items. **NOTE:** There could be up to 5 additional pre-test questions. These questions will not count but may be used on a later version of the test. Your answers to these pre-test questions will not affect your score. Since you won't know which they are, you should answer all questions.

System Diagnosis - 21%

Load sensing proportioning valves
Brake pedal pulsation
Grabbing brakes
Brake lock-up
Dragging brakes
Combination valve
Gear lube in drums
Brake booster

Master Cylinder Diagnosis & Repair - 10%

Low fluid level
Rebuilding
Swollen diaphragm
Sinking pedal

ABS Diagnosis & Repair - 19%

Pump/motor operation
Safety precautions
Speed sensors
Wheel speed readings
3 way circuits
4 way circuits
Hose replacement

Drum Brake Diagnosis & Repair - 21%

Drum finish
Single anchor Bendix type
Self adjuster diagnosis
Noise diagnosis
Measuring
Primary v.s. secondary shoes

Disc Brake Diagnosis & Repair - 17%

Rotor thickness variation
Rotor surface finish
Caliper overhaul
Brake noise
Brake adjustment
Measuring

Repair Procedures - 12%

Brake line bleeding
Brake fluid diagnosis
Replacing wheel bearings/races
Brake adjustments

SAMPLE QUESTION:

A car has a spongy pedal. Which of the following could be the cause?

- A. Air in the system.
- B. An internal master cylinder leak.
- C. Worn brake pads.
- D. Warped brake disc.

ANSWER: A

MECHANIC STUDY GUIDE

Electrical Systems

Automobile & Light Truck Repair

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OHMS Law & Electrical Symbol

Recognition - 14%

Ohmmeter symbol
Splice symbol
Resistor symbol
Switch symbol
Solenoid symbol
Circuit breaker symbol
Variable resistor symbol
Lamp symbol
Diode symbol
LED symbol

Test Methods/Meter & Equipment

Usage - 11%

Ohmmeter usage
Voltmeter usage
Ammeter usage

Starting System Diagnosis - 20%

Capacity/load testing
Starter armature testing
Starter current draw
Starter relay diagnosis
Voltage drop tests
Circuit resistance test
Battery test
Starter drive diagnosis

Charging System Diagnosis - 5%

R & R battery properly
Alternator output testing

Miscellaneous Circuit Diagnosis - 32%

Short to ground
Regulator diagnosis
Blower motor circuit diagnosis
Horn circuit diagnosis
Turn signal circuit
Dimmer switch diagnosis
Tail lamp circuit
Dashlight circuit
Windshield washer pump circuit
Cooling fan circuit
Oil pressure light circuit

General - 18%

Measuring current flow
Voltage drop
Parallel circuit diagnosis
Junction block replacement
E.S.D. (Electrostatic Discharge)
S.I.R. (Supplemental Inflatable Restraint)
precautions

SAMPLE QUESTION:

The maximum allowable voltage drop across the ground circuit of the starter system is:

- A. .2 volt.
- B. .7 volt.
- C. 1/2 volt.
- D. 1 volt.

ANSWER: A

MECHANIC STUDY GUIDE

Heating & Air Conditioning

Automobile & Light Truck Repair

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Heating & Engine Cooling System

Diagnosis - 22%

Leak diagnosis
Low coolant in radiator
Thermostat
Coolant mixture
Low heater output
Windshield fogging
Heater core hose routing
Radiator cap
Defrost operation
Overheating

General Knowledge of A/C Components & Their Functions - 16%

Receiver drier
Ambient temperature switch
Orifice expansion tube
Compressor muffler
Condensor
Evaporator
Fixed orifice tube
Halide tester

General Knowledge of A/C Systems - 18%

R-12 v.s. R134-a
Refrigerant (understanding change between liquid & gas)
Operating pressures
Effect of moisture in the system
Effect of outside temperature & humidity on system

A/C Diagnosis - 24%

H₂O at air ducts
Finding leaks
Overcharged system
Compressor clutch
Gauge set readings
Lack of cold air
Schematic diagnosis

A/C Repair Procedures - 16%

Precautions when discharging system
Compressor o-ring replacement
Correction of excessively high pressure
Compressor replacement
Hose replacement
Charging the system
Leak detection
Condensor replacement

Refrigerant Recovery, Recycling & Handling - 4%

CFC's (Chlorofluorocarbons) and their affect on the environment
Recycle or replace R-12 and R-134a

SAMPLE QUESTION:

An A/C control system has an apparent vacuum leak. Which of the following is the best way to locate the leak?

- A. Feel around the suspected line or component.
- B. Trace the origin of the hissing sound.
- C. Install known good hoses and components in place of the original components.
- D. Spray water on the suspected areas.

ANSWER: B

MECHANIC STUDY GUIDE

Engine Tuneup/Performance

Automobile & Light Truck Repair

Listed below are a number of items and subjects which make up the mechanic certification test identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items. **NOTE:** There could be up to 5 additional pre-test questions. These questions will not count but may be used on a later version of the test. Your answers to these pre-test questions will not affect your score. Since you won't know which they are, you should answer all questions.

Computer Control & Sensor Basics - 24%

ROM (Read Only Memory)
Fault codes
Maintaining stoichiometric balance
Closed loop
Oxygen sensor diagnosis
Knock sensor function
Self diagnosis
Hall sensor pattern reading
Types of meters to use
Scan tool usage
TPS operation

Ignition Systems - 13%

Scope pattern diagnosis
Setting timing
No spark diagnosis
Spark plug voltage requirements

Carburetor & Fuel Injection - 10%

Injector pulse width
Fuel line replacement
E.F.I. principals
"Heavy float" symptoms
Types of injection systems

Performance Basics - 10%

Causes of detonation
Spark plug diagnosis
Dirty air cleaner symptoms
Causes of a lean mixture
Influences on performance

Diagnosis (starting system & miscellaneous) - 18%

Engine timing
Slow cranking diagnosis
Circuit resistance checks
Engine vacuum
Catalytic converter
Cylinder leakage
Compression test

Emission Control Systems - 25%

EGR operation
Evaporative emission control system
Hydrocarbon levels
Oxides of nitrogen
O₂ sensor operation
Fuel vapor recovery system
Carbon monoxide levels
Exhaust analyzer readings
Engine timing & effect on emissions
Catalytic converter's purpose

SAMPLE QUESTION:

In automotive computers, this memory contains information that tailors the computer to the vehicle.

- A. Programmable Read Only Memory (PROM).
- B. Controllable Access Memory (CAM).
- C Random Access Memory (RAM).
- D None of the above.

ANSWER: A

MECHANIC STUDY GUIDE

Unitized Body Structural Repair

Michigan Motor Vehicle Mechanic

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

Steels (Characteristics & Identification) - 12%

UHSS (Ultra High Strength Steel)

HSS (High Strength Steel)

Tensile strength

Identification of various steels

Pulling (Straightening) - 8%

Overpulling

How to minimize tearing

Anchoring

Welding - 20%

MIG

Oxyacetylene

Brazing

Shielding gas

Weld quality

Electrode wire use

Precautions

Types of welds

Types of welders

Repairing Structural Components - 25%

A-pillars & B-pillars

Location of welds

Sectioning

Joints to use

Corrosion protection

Weld-through primers

Glass installation

Measuring/Damage Analysis - 21%

Point to point

Indirect damage

Direct damage

Secondary damage

Primary damage

Datum plane

Asymmetrical dimensions

Vehicle centerline

Centering gauges

Loaded measurement

Unitized Body General Understanding - 14%

Crush zones

Design features which initiate the crush process

Space frame construction

Manufactures' tolerances

One-time fasteners

SAMPLE QUESTION:

Two-part epoxy primers:

- A. Provide corrosion protection close to OEM E-coat.
- B. Have an indefinite pot life.
- C. Should be used on structural parts only if a lacquer primer surfacer is not available.
- D. All of the above.

ANSWER: A

MECHANIC STUDY GUIDE
Collision-Related Mechanical Repair
Michigan Motor Vehicle Mechanic

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

Steering Components - 12%

Adjustments
Rack & Pinion
Power Steering

Heating & Cooling - 10%

General Questions

Electrical - 30%

Turn Signals
Horn Circuit
Lights
Starter system

Drive Train - 28%

Bearings
Noise Diagnosis
Transaxle
Transmission Linkage

Brakes - 10%

Brake Lines
Hydraulics
Measuring Techniques

Miscellaneous - 10%

Steering Columns
Fuel Leaks

SAMPLE QUESTION:

The mechanic notices antifreeze under the car after completing collision repairs. What should he or she do next?

- A. Remove the radiator and pressure test.
- B. Warm up the engine thoroughly then recheck.
- C. Visually inspect the vehicle for signs of a leak.
- D. Nothing, it is normal for the cooling system to leak after a collision.

ANSWER: C

MECHANIC STUDY GUIDE

Motorcycle Repair

Michigan Motor Vehicle Mechanic

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

Fuel Systems - 10%

Causes of a lean mixture
Carburetor systems; float, power, choke, etc.
Spark plug diagnosis
Causes of a rich mixture
Idle mixture adjustment
Diagnosis of a worn needle and seat
Crankcase flooding diagnosis
Carburetor jets
Understanding the idle circuit on a slide type carburetor

Skill in Measuring - 13%

Measuring piston ring grooves
Crankshaft end-play
Using plastigage
Using a dial indicator
Spark plug gap
Shaft run-out
Cylinder bore measurements
Understanding decimal equivalents up to 1/1000"
Piston ring end-gap
Reading a micrometer
Understanding metric system measurements

Repair Skills - 17%

Cylinder head bolt torque procedure
Compression test
Repairing float valve wear
Replacing a steel bearing race in aluminum case
Replacing the master link in a drive chain
Valve adjustment
Finishing cylinder walls at overhaul
Fitting pistons to the cylinder
Cylinder leak down test
Valve guide wear
Oil pump installation
Breaker point alignment
Checking for bent forks

Diagnosis - 17%

Poor running with black smoke under heavy throttle
Transmission shifting problems
Backfire
Spark plug fouling and diagnosis
Undershifting or jumping out of gear problem
Coil diagnosis
Hard starting or no start problems
Low oil pressure
Restricted air intake
Rough running and backfiring problems

Ignition & Electrical - 20%

C.D.I. systems compared to point systems
Flywheel stampings
Splicing electrical connections
Continuity testing
Checking voltage in a system
Diagnosing turn signal circuits
Master cylinder operation
Point burning
What tool is necessary to time a flywheel
Timing advance
Alternator output problems
Diagnosing a condenser
Battery charging rates
Zener diode operation

(continued)

MECHANIC STUDY GUIDE

Motorcycle Repair

Michigan Motor Vehicle Mechanic

General - 23%

Sticking hydraulic forks
Deglazing cylinders
Understanding the 4-stroke cycle engine
Clutch operation and diagnosis
Full floating piston pins
Oil pressure relief valve operation
Alternator or generator operation
Brake system operation
Adjusting steering stem bearings
Piston slap
Camshaft operation
What is a hydrometer used for
Front drum brakes
Spark plug “reach”
Oil consumption

SAMPLE QUESTION:

Oil circulation in the engine:

- A. Goes from sump to oil pump to bearings to filter.
- B. Goes from filter to bearings to oil pump.
- C. Goes from bearings to filter to oil pump to sump.
- D. Goes from sump to oil pump to filter to bearings.

ANSWER: D

MECHANIC STUDY GUIDE

Recreational Trailer

Michigan Motor Vehicle Mechanic

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Electrical Diagnosis - 36%

Trailer tail lamps
Ground wire problems
Turn signal circuits
Determine voltage drop
Trailer stop lamps
Brake controllers
4-Wire connectors
Current supply for trailer brakes
Electrical symbols
Flasher diagnosis
Color codes
Causes of blown fuses
Current flow/resistance

Brake Diagnosis - 26%

Loss of brakes
Grabby brakes
Dragging brakes
Erratic braking, surging
Pull to one side during braking
Adjusting trailer brakes
Brake shoe recognition

Springs/Hitches - 16%

Leaf springs
Equalizing hitches
Adjustment of hitches
Types of trailer springs
Spring maintenance

General Knowledge - 12%

Surge brakes
Reducing sway
Wheel bearing adjustment
Hydraulic brake lines
Metric measurements
Tire wear diagnosis

Wheels/Hubs - 10%

Wheel bearing diagnosis
Wheel bolt torquing pattern

SAMPLE QUESTION:

Current flow resistance is decreased when:

- A. Wire length is increased.
- B. Wire diameter is decreased.
- C. Corroded terminals are replaced.
- D. All of the above.

ANSWER: C

MECHANIC STUDY GUIDE

Engine Repair - Gasoline

Heavy Duty Trucks

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

Engine Mechanical Components - 16%

Cylinder blocks
Pistons
Fuel pumps
Spark plugs
Governors
Cylinder heads

SAMPLE QUESTION:

What are the minimum and maximum measurements of a shaft given as 3.750 plus or minus .010?

- A. 3.650 - 3.850
- B. 3.749 - 3.751
- C. 3.740 - 3.780
- D. 3.740 - 3.760

Diagnosis - 30%

Engine Miss
Compression test diagnosis
Rough idle
Engine knocks
Power loss
Blue smoke
Overheating

ANSWER: D

Basic Procedures - 22%

Grinding valves
Starting a flooded engine
How to measure cam lobe wear
Measuring plug wire resistance
Engine assembly
Understanding bolt markings
Valve Adjustment

Skills In Measuring - 14%

How to check cylinder head flatness
How to check crankshaft end-play
Reading a micrometer
Reading plastigage
Measuring main and rod journals

System Operation - 18%

Understanding how engines operate
Purpose for checking clearances
Understanding carburetor operation
Cooling system operation
Engine timing
Ignition systems

MECHANIC STUDY GUIDE

Engine Repair - Diesel

Heavy Duty Trucks

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

Engine Components - 24%

Detroit blower rotor clearance adjustment
Piston rings
Piston ring grooves
After cooling - benefits
Bolt grade recognition
Lube oil coolers
Turbo charger operation
Valve bridge function

Diagnosis - 34%

Turbo problem diagnosis
Coolant in crankcase
Smoke problem diagnosis
Engine operating temperature
Low oil pressure
Engine tear-down diagnosis
Blow-by
Crankshaft diagnosis
Engine Miss

Lube & Fuel - 10%

Direct injection
Leaky fuel lines
Restarting an engine that has run out of fuel
Fuel Filters

Skills In Measuring - 12%

Tools for measuring
Plastigage reading
Cylinder taper
Reading a micrometer
Crankshaft End-play

Miscellaneous - 20%

Using a vacuum gauge
fuel shut-off solenoid
Idle speed
Detroit diesel R.P.M. setting
Understanding 2-stroke, 4-stroke engines
Valve seat width
Valve lash adjustment
Overheating

SAMPLE QUESTION:

A diesel engine misses at all speeds and there is a puff of smoke when it misfires. What is the most likely cause of this problem?

- A. Erratic governor action.
- B. Stale fuel.
- C. A miscalibrated pump.
- D. A sticking nozzle.

ANSWER: D

MECHANIC STUDY GUIDE

Drive Train Heavy Duty Trucks

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

Clutch Diagnosis - 10%

Causes of hard shifting
Free play
Hydraulic clutch fluid
Reason for clutch slipping

Clutch Components - 12%

Clutch brake
Pilot bearing
Linkage adjustment

SAMPLE QUESTION:

Which of the following could cause driveline vibration?

- A. Bad engine mounts.
- B. Crossed plug wires.
- C. Over lubed universal joints.
- D. All of the above

ANSWER: A

Axle & Driveline Diagnosis - 22%

Adjusting driveline angles
Pinion bearing preload
Axle shaft replacement
U-Joint angles
Air shift controls
Two-Speed planetary axle

Axle & Drive line Components - 22%

Ring and pinion backlash
Inter-axle differential lock
Drive shaft removal
Pinion bearing preload adjustment
U-joint replacement
Differential side bearing preload

Transmission Diagnosis - 22%

Causes of hard shifting
Gear slipout
Slow shifting problem in a twin countershaft transmission

Transmission Components - 14%

Synchronizers
Seal installation
10-Speed twin countershaft operation
4 & 5-Speed synchronized transmissions
Transmission Interlock

MECHANIC STUDY GUIDE

Brakes & Braking Systems

Heavy Duty Trucks

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

Basic Knowledge - 20%

Inversion valve function
Anti-skid brakes
Hydraulic brake line material
Air brake hand valve
Brake chatter
Vacuum booster operation
Air brake line routing
Engine (Jacobs) brake
Air over hydraulic systems

Repair Skills, Air Brakes - 8%

Finding air leaks
Adjusting cam actuated brakes
Brake linkage lubrication
Air line material

Repair Skills, Hydraulic Brakes - 10%

Wheel cylinder assembly
Power booster
Master cylinder residual valve
Master cylinder operation

Diagnosis, Air Brakes - 34%

"S" cam brakes
Air pressures for fail-safe brakes
Cause of excessive air pressure
Dual diaphragm brake chamber operation
Compressor operation
Tractor protection valves
Air brake systems operation
Inoperative trailer brakes
Straight truck air line and operation
Trailer brakes won't release

Diagnosis, Hydraulic Brakes - 14%

Causes of a pulsating pedal
Brake booster operation
Swollen master cylinder diaphragm
Cause of gear lube inside brake drums
Brake lining wear diagnosis
Grabbing brakes

Basic Repair Procedures - 14%

Spring brake repairs
Pushrod travel
Air reservoirs
Slack adjuster and pushrod angle
Grease-soaked brake linings

SAMPLE QUESTION:

Which of the following should a mechanic do before taking apart a spring-type parking brake?

- A. Fill the air reservoir.
- B. Remove the quick release valve.
- C. Remove the diaphragm clamp.
- D. Cage the spring.

ANSWER: D

MECHANIC STUDY GUIDE

Suspension & Steering Systems

Heavy Duty Trucks

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

Steering System Diagnosis - 18%

Hard steering complaint
Recovering from a turn
Noise in the power steering unit
Wheel shimmy
Tie rod end wear
Oil foaming in power steering system

Suspension Diagnosis - 14%

Air ride suspension operation
Leaf spring failure
Tire problems
Hendrickson suspensions
Torque rods
Tandem axle alignment

Wheel Alignment - 12%

Causes of uneven and rapid tire wear
Front end alignment procedure
Toe-in adjustment
Tire wear diagnosis

Caster/Camber - 6%

How to adjust caster on a solid axle
Recognize extreme conditions from a picture

Basic Steering System Knowledge - 32%

Front suspension components
Steering gears
Wheel bearings
Steering Wheel freeplay
Steering knuckle wear
Installing kingpin bushings
Sector shaft adjustment
Power steering pump replacement

Basic Suspension Knowledge - 18%

Cap screw head markings
Suspension adjustment
Equalizing beam suspensions
Adjustable trailer axles

SAMPLE QUESTION:

A tractor trailer rig with tandems on both units rides and handles good when loaded. When unloaded, the rig wobbles. Which of the following is the most likely cause of this condition?

- A. Misaligned trailer tandems.
- B. Wrong caster settings.
- C. Misaligned tractor tandems.
- D. Wrong toe setting.

ANSWER: B

MECHANIC STUDY GUIDE

Electrical Systems

Heavy Duty Trucks

Listed below are a number of items and subjects which make up the mechanic certification tests identified above. An individual's ability to pass the certification test will depend upon the amount of knowledge the person has concerning these items:

System Diagnosis - 22%

- Lamp circuits
- High & low beam headlamp questions
- Dash lights
- Alternator circuits
- Windshield wiper circuit
- Oil pressure sending unit
- Circuit diagnosis
- Horn Circuits

General - 10%

- Batteries
- Fusible links
- Hydrometer use
- Jump starting
- Fuse box replacement

Vehicle Lighting - 18%

- Turn signal circuit
- Tail lamp circuit
- Head lamp circuit
- Dash light circuit
- Clearance lights

Starting Systems - 24%

- Battery hook-ups
- Starter circuit resistance
- Specific gravity readings
- Solenoid problems
- Starter draw test
- Starter drives
- Starter no-load test

Charging Systems - 12%

- Low or unsteady alternator output
- Alternator Circuitry
- Overcharged battery problem
- Alternator amperage limit

Test Methods & Equipment - 14%

- Voltmeter use
- Ohmmeter use
- Circuit testing
- Verifying a circuit drain
- Alternator rotor tests
- Ammeter use

SAMPLE QUESTION:

The alternator output current is 0 amps. What could cause this condition?

- A. An open diode.
- B. A grounded rectifier bridge.
- C. An open rotor winding.
- D. All of the above

ANSWER: C